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ABSTRACT

An examination of Chapter 1 services delivered in St. Louis, Missouri and Lincoln, Nebraska, the coordination of those services with other categorical programs, and the effectiveness of those services for Chapter 1 students revealed the following conclusions: (1) relatively few Chapter 1 students receive multiple categorical program services; (2) the multiplicity in program participation more frequently occurs within the Chapter 1 program, where students could participate in reading and mathematics programs simultaneously; (3) a five-year comparison of funding and participation levels demonstrates a sharp reduction in both for the St. Louis Public Schools, in part due to a reduction in the overall student population; (4) characteristics of recipients of categorical services revealed that the grade level of most participants reflect district or state philosophy in the delivery of service; (5) Chapter 1 students in St. Louis score five to ten NCEs lower than district students; (6) Chapter 1 students receive services for almost three years on the average; (7) of the first grade cohort that was continuously enrolled for five years, almost 85 percent in St. Louis participated in Chapter 1 in some point in time; (8) the most prevalent pattern for receiving multiple years of Chapter 1 services was alternating years of reading, math, or both services; (9) average achievement level of Chapter 1 students varied with length of participation; (10) the longitudinal achievement of the first grade cohort of Chapter 1 participants remained relatively stable over time; and (11) in St. Louis over a five-year period 60 percent of Chapter 1 students and 9 percent of non-recipients have been retained in a grade. Data are presented on 16 tables. (BJV)

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# ANALYSES OF CATEGORICAL PROGRAM PARTICIPATION AND LONG-TERM EFFECTS

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## SUMMARY OF FINDINGS

- Relatively few Chapter 1 students receive multiple categorical program services. As a matter of district policy in St. Louis, students do not participate in more than one categorical program. Only one percent of Chapter 1 students in the Lincoln School District also receive some type of special education services within a school year. Approximately 50 percent of students in St. Louis and 20 percent of students in Lincoln participate in a categorical program.

- The multiplicity in program participation more frequently occurs within the Chapter 1 program, where students could participate in reading and math programs simultaneously. Within recent years, the Lincoln School District has shifted the targeting of its Chapter 1 services and provides dual and simultaneous services in reading and math to more than one-half of Chapter 1 participants. This practice replaces the historical tendency to serve students in one subject in one year, and alternating subject areas in subsequent years.

- A five-year comparison of funding and participation levels demonstrates a sharp reduction in both for the St. Louis Public Schools, in part due to a reduction in the overall student population. Both Chapter 1 funding and participation has increased in the Lincoln School District over the past five years. Both districts experienced a rather dramatic cutback in funds in the 1982-83 fiscal year.

- Characteristics of recipients of categorical services (in terms of grade level, minority and gender representation) revealed that the grade level of most participants reflect district or state philosophy in the delivery of services. In St. Louis, an emphasis on early intervention and remediation has resulted in the delivery of services at increasingly earlier grade levels (and including a large Pre-K and kindergarten Chapter 1 program). In Lincoln the focus on the lowest-achieving students regardless of grade level has resulted in the relatively equal distribution of services across grade levels. In terms of ethnic minority representation, the characteristics of categorical program participants were comparable to the characteristics of the district population. Chapter 1 participants in St. Louis tended to have slightly higher minority representation, but in a district that is 80 percent minority, the higher percentage participation is not dramatic. Minority representation in Chapter 1 in the predominantly white Lincoln school district was three times the percentage of minority students districtwide, but was still low at 7 percent. When viewed over time, participation in reading programs tended to be slightly more male dominated, and math programs were slightly more female dominated.

- Five-year cross-sectional patterns of achievement across grades and years in St. Louis revealed that Chapter 1 students score between the 34th and 43rd NCE while district students score approximately

five-to-ten NCEs higher, depending on grade level. Both demonstrated higher average achievement scores in math than in reading in all grades and over time. Cross-sectional achievement in the Lincoln School District demonstrated a much higher-performing Chapter 1 population as well as district population. The lowest performing Chapter 1 students in Lincoln performed comparably to the highest performing Chapter 1 students in St. Louis. Five-year math performance in Lincoln demonstrated a sizable increase for both Chapter 1 and district students at most grades.

- Longitudinal analysis of a first-grade cohort over five years revealed that Chapter 1 students receive services for almost three years on average in both school districts. Less than 10 percent of students in either district participated for the full five years; in St. Louis 20 percent and in Lincoln 33 percent were served for only one year.

- Of the first grade cohort that was continuously enrolled for five years, almost 85 percent in St. Louis participated in Chapter 1 at some point in time. This compares to only 15 percent in the Lincoln School District.

- In both school districts, the most prevalent pattern for the receipt of multiple years of Chapter 1 services was alternating years of reading, math or both services. Of the Chapter 1 students who participated for more than one year, less than one-third received services in contiguous years. Very few students in either district were served by the simultaneous receipt of reading and math instruction over time.

- Longitudinal achievement of students participating in Chapter 1 for various lengths of time revealed that average achievement level varied consistently with length of participation. One-year Chapter 1 participants in both districts scored 15 NCE scores higher than did five-year participants in reading. Average math performance demonstrated less dramatic variation among differing years of Chapter 1 math participation.

- The longitudinal achievement of the first grade cohort of Chapter 1 participants remained relatively stable over time. Only five-year recipients of Chapter 1 reading instruction demonstrated gains in relative standing over time within this cohort of students. However, the longitudinal achievement of a cohort of second graders over five years demonstrated sizable increases in both reading and math achievement. Conclusions regarding the sustained achievement of Chapter 1 recipients vary considerably from one sample to another. In the Lincoln School District, average achievement for Chapter 1 students in both the first and second grade cohort demonstrated steady increases, generally on the order of 4 to 5 NCEs overall. The average achievement of district students showed a similar increase over time.

- Over a five-year period of time in St. Louis Public Schools, 60 percent of Chapter 1 recipients and 9 percent of non-recipients have been retained in grade. This compares to a 9 percent retention for Chapter 1 students and 4 percent retention for non-recipients in Lincoln.

## INTRODUCTION

This study was designed to examine E.C.I.A. Chapter 1 services delivered in selected school districts, the coordination of those services with other categorical programs, and the effectiveness of those services for Chapter 1 students. "Categorical programs" were defined as state-supported compensatory education, special education, or bilingual education programs. Existing school district records in the St. Louis, Missouri and Lincoln, Nebraska school districts were examined to (a) determine the patterns of categorical services students receive over multiple years, and the extent to which students receive multiple services within a given year; and (b) to determine the longer-term educational accomplishments of students who have been served by compensatory education programs in two districts that differ in terms of community and program contexts.

## RESEARCH DESIGN AND STUDY METHODOLOGY

The study was designed to address the following questions within the two broad areas of interest.

### Research Category 1. Analysis of Patterns of Services to Students

- What are the patterns of program participation among categorical programs? Within Chapter 1, what are the patterns of participation among reading, math and both reading and math programs? How have these patterns in the receipt of services changed over time?

- What are the characteristics of categorical program participants in terms of grade level, achievement level, race/ethnicity, and gender? Have the characteristics of recipients changed over time during the past five years? How do they compare to the characteristics of district students?

### Research Category 2. Long-Term Accomplishments of Chapter 1 Recipients

- What are the patterns and frequency of entry into and exit from Chapter 1 over a five-year period? What is the average number of years that students receive Chapter 1 services?

- What are the sustained achievement reading and math gains of Chapter 1 students over time? How do they compare to the sustained achievement of district students?

- Do recipients and non-recipients of Chapter 1 services demonstrate different rates of retention in grade? How do these retention rates compare to the retention rates of non-recipients?

In order to address the questions in the first research category, district data bases were accessed that contained five-year cross-sectional data on individual student participation in categorical programs, the characteristics of participants and non-recipients, and reading and math

achievement. To assess the long-term participation and accomplishments of Chapter 1 participants, longitudinal data bases over a five-year period were constructed for a first grade and a second grade cohort beginning in 1981-82. The results of five-year cross-sectional and longitudinal analyses are described in the following sections.

## Description of Project Site Selection

The selection of project sites was based on several criteria, including (1) the existence of multi-year data bases comprised of individual student records that included a student-level description of categorical services students receive, as well as a number of demographic descriptors; (2) past demonstrations of district interest in research, their willingness to participate in such an endeavor, and their capability for mainframe analyses supported by a statistical package; and (3) site variation on a number of variables that are likely to affect categorical program participation, including the percent of students at or beneath the poverty level.

The St. Louis and Lincoln school districts were selected as study sites because of a number of characteristics, including the fact that they both:

- Serve elementary and middle grades exclusively
- Maintain computerized data bases on individual students
- Conduct districtwide testing each year
- Have implemented student identification numbering procedures that allow for tracking students over time and across yearly data bases
- Maintain data on individual students in terms of grade level, gender, race/ethnicity, standardized test scores, and the specification of categorical programs in which students participate
- Have maintained the above information for the past five years.

Despite these similarities, these districts contrast sharply in the community contexts and characteristics of the student populations for which Chapter 1 services are provided. The St. Louis Public Schools, for instance, serves a more impoverished large urban population, where the average district level of achievement is below the 50th percentile, the percent of the district below the poverty level exceeds fifty percent, more than 80 percent of the district students are minority students, and high school graduation rates are less than 50 percent. In contrast, the Lincoln School District operates in a small city setting where the majority of residents are in professional or managerial occupations, only 20 percent of the district's students are below the poverty level, average district basic skills achievement is above the 60th percentile, and high school graduation rates exceed 90 percent.

## Description of Categorical Programs in Study Sites

The St. Louis Public Schools operate in a large urban inner city setting. The district is distinguished from its suburban counterparts largely on poverty and racial lines. A mandatory desegregation program was instituted as a result of a 1980 court decision. School district boundary lines were redrawn to include outlying suburban communities in

the St. Louis district; busing of students and the creation of magnet schools were initiated. Despite five years of desegregation efforts, the St. Louis public schools' minority population remains at approximately 80 percent of the student population.

The St. Louis District has provided Title I/Chapter 1 program services continually since 1965. Chapter 1 services are currently provided in each of the 73 elementary and 29 middle schools in the district for grades 1-8. In addition to Chapter 1, the district provides special education services and bilingual education programs for a primarily Southeast Asian population.

Chapter 1 instructional services in St. Louis are delivered through several program models, all of which may employ a range of teaching strategies. Elementary, middle, and K-8 schools with self-contained classrooms use either the pullout or in-class models: pullout programs in reading may select from four unique instructional delivery systems; in-class programs may select from two instructional delivery systems. All math programs use the same instructional delivery system. Students in departmentalized middle schools are served using the replacement model, where Chapter 1 reading or math instruction replaces reading and math courses normally taught by the district.

Chapter 1 pullout and in-class instruction ranges from 30 to 50 minutes daily, and replacement programs instruct for 40 to 50 minutes. At least five and no more than ten students are served during each pullout or in-class instructional session. Replacement model programs may serve up to twice as many students.

After-school and pre-kindergarten programs are also provided at some elementary schools. After-school programs provide additional services to students in grades one through five who cannot be served during the regular school day due to a lack of space or program availability. Each student attends three days per week for an hour of instruction each day. The pre-kindergarten program enrolls three and four-year olds who score below a designated cut-off on a developmental screening test. As a part of program services, parents are provided information on how to provide a more stimulating environment for their preschooler to encourage language, intellectual and social development.

Schools are required to retain the same instructional delivery system for at least three years. Ongoing evaluations are used to inform judgments regarding continuation of the instructional approach used. As a result, some schools have retained the same model and instructional delivery system for many years, while other schools have opted or have been required to select different instructional strategies to improve Chapter 1 student performance. To meet state regulations for student selection, students are selected for Chapter 1 participation on the basis of a standardized achievement test score. The district must document for state monitors that at least 95 percent of its Chapter 1 students have been selected on this basis alone; in the remaining 5 percent of student participants selected, teacher judgment of educational need may be additionally utilized from the state's perspective. The St. Louis district does not allow even five percent teacher judgment. Upon teacher request, however, students deemed in need of Chapter 1 services can be

retested when the test score is thought to be unreflective of student performance capabilities. Cut-off scores for student eligibility differ by grade levels due in part to the state's emphasis on early intervention and the desire to serve students at the earliest sign of basic skills deficiencies. To be eligible for Chapter 1 participation, students must test below the 45th percentile in kindergarten through third grade; below the 40th percentile in grades four through six; below the 36th percentile in grade seven; and below the 32nd percentile in grade eight. Students are prioritized according to educational need, with the lowest scoring students receiving first consideration.

The St. Louis district receives an annual Chapter 1 allocation of roughly $9 million, a decline from the $15 million allocation received in 1980-81. The reduction in funds was in part due to the 13 percent decline in district enrollment over this time period. The reduction of funds was mirrored in the numbers of students served by Chapter 1, which declined from 16,590 students served in 1981-82 to approximately 11,000 served in 1985-86. Thus, while funding decreased by more than 40 percent over the five-year period, the number of students participating in Chapter 1 programs decreased by about one-third.

The Lincoln School District operates in a community supported by the state university and state government. The total population within the school district boundaries in 1985-1986 was 193,000, and the school district enrollment was 23,900. The overall percentage of families below the poverty level is not unusually high. Some schools, however, may have 40 percent of their students qualifying for free or reduced lunches.

The Lincoln School District has operated a Title I/Chapter 1 program continuously since 1965. Ten of the thirty-three elementary schools currently provide Chapter 1 reading and math services in grades one through six. In addition to Chapter 1, state and district compensatory education services are available in another seventeen elementary schools, in seven of the eight junior high schools, and all five high schools. The district also provides special education services as required by law; in 1983-1984, a bilingual education program was begun for the rapidly growing Southeast Asian population.

The Chapter 1 program provides each participating student in grades 1-6 with either teacher-directed or computerized supplemental instruction (or both) each day in reading and/or mathematics. Instruction and project design vary from school to school. Some schools have pull-out classes, some instruct students both in pull-out and in-class instruction, and some offer after school classes. Despite this variation in service delivery patterns, a district-wide management plan ensures that all schools adhere to the tenet that Chapter 1 and regular classroom teachers use the same instructional objectives and cooperate in the education of each Chapter 1 student. Weekly building level plans for coordinating Chapter 1 and regular programs are a project requirement.

In addition to overall instructional program coordination, each Chapter 1 student is provided with an individual education plan (IEP) using the instructional objectives of the district. The IEP is developed jointly by the Chapter 1 and regular classroom teacher and is subject to parental approval. Students receive daily feedback on the extent to which

objectives in their IEP have been met, and Chapter 1 and regular classroom teachers meet in weekly coordination sessions. A district-wide evaluation system ensures that each school receives a report describing their annual and longitudinal achievement gains. The Lincoln Chapter 1 project was selected as an exemplary project in 1985 as part of the Chapter 1 National Recognition Project.

Nebraska's state Chapter 1 guidelines permit and encourage schools to use multiple criteria for selecting students for Chapter 1. Each spring classroom teachers in Chapter 1 eligible schools rate the progress of students in both reading and mathematics in kindergarten through fifth grade using an eight-point rating scale. A rating of one indicates that the student's classroom performance places him or her in the bottom one-eighth of the class, while a rating of eight indicates performance in the uppermost one-eighth of the students. Teacher ratings are combined with test scores on the spring administration of a standardized test to form composite scores in reading and mathematics. Ratings and test scores are weighted equally in computing composite scores. Students are ranked according to educational need, and the lowest scoring students receive services first.

The Lincoln School District receives an annual Chapter 1 allocation of roughly one million dollars, an increase of nearly $300,000 since 1981-1982. In only one year, 1982-1983, did Lincoln experience a decrease in funds, and that decrease was followed by a 21 percent increase the following year. The number of students served by Chapter 1 has also increased over the same period. However, while funding has increased by 44 percent since 1981-1982, the number of students participating in Chapter 1 programs has increased by only 21 percent. The apparent difference in funding and numbers of students served is eliminated when duplicated counts are examined. In recent years, the Lincoln School District has increased the delivery of both reading and math services to its Chapter 1 participants.

## WHAT ARE THE PATTERNS OF PARTICIPATION AMONG CATEGORICAL PROGRAMS?

As a matter of St. Louis district policy, participation in more than one categorical program is prohibited. Students can only participate in one of the three categorical programs--Chapter 1, bilingual/ESL, and special education-- during any one year. Almost 60 percent of the St. Louis student population in grades one through eight participated in some type of categorical program in 1981-82. This percentage declined to slightly less than 50 percent of the population in 1985-86, solely due to the decline in Chapter 1 participants. Participation in special education remained at a fairly constant percentage over five years at slightly under 20 percent of the student population, and bilingual/ESL participation increased with the institution of this program in 1983-84 to meet the needs of a recently-immigrated Southeast Asian population.

A five-year examination of Chapter 1 participation demonstrates a fairly systematic decline in the numbers of recipients, ranging from 16,590 Chapter 1 participants in 1981-82 (which is almost 40 percent of the district's first through eighth graders), to 10,892 Chapter 1 participants in 1985-86 (or thirty percent of the district's first through eighth graders). Due to a cutback in state Chapter 1 funds, 1982-83 demonstrated an uncharacteristic reduction of Chapter 1 participants to 7,722, or 19 percent of the district's enrollment in grades 1-8. These data are displayed in Table 1.

The proportion of the district's students in each grade participating in the Chapter 1 program was examined over a five-year period. These data are displayed in Table 2, and indicate that in 1981-82 about one-half of the students in grades one through seven were recipients of Chapter 1 services. The exception to the pattern was in second grade, where only forty percent of second graders were Chapter 1 recipients, and in eighth grade where less than forty percent were Chapter 1 recipients. The tendency for a substantially lower proportion of second graders to receive Chapter 1 services was also demonstrated over time, and is perhaps explained by the district's propensity to retain first-graders who experience difficulty in basic skills. Given two years of first grade instruction for a sizable portion of first grade students, one would expect fewer students to be in need of Chapter 1 services in the second grade.

The five-year trend analysis is disrupted by the dramatic effect of the loss of Chapter 1 services to one-half of the typical recipient population in 1982-83. Disregarding this uncharacteristic year, the proportions of students receiving Chapter 1 services continually dwindled at every grade level over time. By 1985-86, roughly one-third to forty percent of students in grades one through seven received Chapter 1 services; only 21 percent of eighth graders were recipients. The percentage distribution of Chapter 1 participants by grade over time is displayed in Table 3, and provides further indication that the first grade consistently demonstrates the highest rate of Chapter 1 participation, followed by third through fifth grades. Second graders and upper elementary grades consistently generate fewer participants, which is in keeping with the district's policy of enforcing stricter selection criteria at those upper grades.

Table 1. Participation in Categorical Programs FY 1982 - FY 1986

St. Louis Public Schools

| | 1981-82 | | 1982-83 | | 1983-84 | | 1984-85 | | 1985-86 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chapter 1 | 16,590 | 39% | 7,722 | 19% | 15,562 | 38% | 11,730 | 31% | 10,892 | 29% |
| Bilingual/ESL | 0 | | 0 | | 87 | <1% | 130 | <1% | 527 | 1% |
| Special Education | 8,010 | 19% | 6,733 | 17% | 6,753 | 16% | 6,730 | 18% | 6,745 | 18% |
| Non-Recipients | 18,090 | 42% | 25,693 | 64% | 18,661 | 45% | 19,189 | 51% | 19,376 | 52% |
| Total District | (42,690) | | (40,148) | | (41,063) | | (37,779) | | (37,540) | |

Lincoln School District

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chapter 1 | 856 | 8% | 901 | 8% | 815 | 7% | 874 | 8% | 977 | 8% |
| Bilingual/ESL | | | | | | | 70 | <1% | 56 | <1% |
| Special Education | 1,129 | 10% | 1,151 | 11% | 1,311 | 12% | 1,250 | 11% | 1,362 | 11% |
| Chapter 1 and Special Ed. | 157 | 1% | 122 | 1% | 134 | 1% | 107 | 1% | 114 | 1% |
| Non-Recipients | 9,052 | 81% | 8,700 | 80% | 8,731 | 79% | 8,788 | 79% | 8,756 | 79% |
| Total District | (11,194) | | (10,875) | | (10,991) | | (11,089) | | (11,265) | |

Table 2. Percent of Students in Grade Participating in Chapter 1 FY 1982 - FY 1986

St. Louis Public Schools

| Grade | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|
| 1 | 56% | 26% | 49% | 47% | 39% |
| 2 | 41 | 19 | 42 | 37 | 33 |
| 3 | 48 | 23 | 51 | 44 | 44 |
| 4 | 52 | 23 | 52 | 45 | 44 |
| 5 | 51 | 21 | 46 | 38 | 38 |
| 6 | 48 | 29 | 47 | 35 | 35 |
| 7 | 46 | 24 | 41 | 30 | 31 |
| 8 | 37 | 19 | 33 | 23 | 21 |

Lincoln School District

| | | | | | |
|---|---|---|---|---|---|
| 1 | 6% | 6% | 7% | 8% | 8% |
| 2 | 11 | 10 | 8 | 9 | 9 |
| 3 | 9 | 9 | 8 | 8 | 9 |
| 4 | 8 | 10 | 8 | 8 | 8 |
| 5 | 6 | 9 | 7 | 8 | 9 |
| 6 | 5 | 6 | 7 | 7 | 8 |

Table 3. Percent of Chapter 1 Students by Grade FY 1982 - FY 1986

St. Louis Public Schools

| Grade Level | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|
| 1 | 19% | 18% | 16% | 20% | 18% |
| 2 | 11 | 10 | 12 | 13 | 13 |
| 3 | 13 | 13 | 14 | 15 | 16 |
| 4 | 13 | 13 | 14 | 14 | 15 |
| 5 | 13 | 11 | 13 | 12 | 12 |
| 6 | 11 | 15 | 12 | 11 | 11 |
| 7 | 11 | 12 | 11 | 9 | 10 |
| 8 | 9 | 9 | 8 | 7 | 6 |
| | (16,590) | (7,722) | (15,562) | (11,730) | (10,892) |

Lincoln Public Schools

| | | | | | |
|---|---|---|---|---|---|
| 1 | 12% | 12% | 16% | 18% | 17% |
| 2 | 25 | 21 | 17 | 20 | 19 |
| 3 | 18 | 19 | 18 | 16 | 18 |
| 4 | 18 | 18 | 19 | 16 | 14 |
| 5 | 14 | 18 | 13 | 16 | 17 |
| 6 | 12 | 13 | 15 | 14 | 15 |
| | (856) | (901) | (815) | (874) | (977) |

Chapter 1 students may receive services in either reading, math or both reading and math in any given year. A five-year percentage distribution of participation in these Chapter 1 programs (depicted in Table 4) indicates that roughly two-thirds of Chapter 1 participants receive reading instruction exclusively, about 20 percent receive only math services, and 15 percent receive both reading and math services. These percentages remained fairly constant over time, except for the impact of the loss of funds in 1982-83. The effect of that reduction was that services to the program with most participants -- the reading only program -- suffered the greatest cut. The number of math only participants remained constant; the percentage increase demonstrated in the table merely reflects the fact that there were fewer Chapter 1 participants overall, thereby increasing the percentage representation.

In the Lincoln School District, 20 percent of students overall participate in some categorical program: eight percent in Chapter 1, about 11 percent in special education, 1 percent in bilingual education, and 1 percent in both Chapter 1 and special education programs. For some types of special education classifications, students may be dually served by Chapter 1 and special education, or may be sequentially served by both programs within a school year. Chapter 1 students in the Lincoln School District may receive services in reading, math, or both reading and math in a given year. However, relatively few students experience multiple program participation.

A five-year examination in the Lincoln School District demonstrates that Chapter 1 participation in 1985-1986 increased by 12 percent from the 1981-1982 level. In 1981-82, 856 students were served as compared to 977 in 1985-86. The proportion of Chapter 1 student participation has remained nearly constant across the five years at the 8 percent level. Special education participation has also remained constant at the 11 percent level with an additional 1 percent receiving both Chapter 1 and special education services. Since the proportion of district students participating in Chapter 1 has remained relatively constant at about 8 percent, recent increases in the number of Chapter 1 participants appear to be due to increases in the district's enrollment. These data are displayed in Table 1.

The district's tendency to serve basic skills deficient students regardless of grade level is demonstrated by the relative lack of variation in the percentage of students in each grade who participate in Chapter 1. As indicated in Table 2, between five and eleven percent of the students in grades one to six participate in Chapter 1. These percentages have stabilized over the past three years at seven to nine percent.

Examination of the percentage distribution of Chapter 1 students across grades one to six is displayed in Table 3. The percentage of Chapter 1 students served in grades one to three varied between 12 and 25 percent; the percentage of students served in grades four to six was relatively more stable, varying between 12 and 19 percent.

Chapter 1 students in the Lincoln School District may also receive services in either or both reading and math. The five-year analysis of program participation patterns demonstrates a rather dramatic shift in

Table 4. Percentage Distribution of Participation in Chapter 1 Subject Areas

St. Louis Public Schools
Unduplicated Count

| | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|
| Reading Only | 66% | 57% | 73% | 66% | 62% |
| Math Only | 17 | 29 | 13 | 20 | 22 |
| Both Reading & Math | 18 | 13 | 14 | 14 | 15 |
| | (16,590) | (7,722) | (15,562) | (11,730) | (10,892) |

Duplicated Count

| | | | | | |
|---|---|---|---|---|---|
| Reading | 70 | 62 | 76 | 70 | 67 |
| Math | 30 | 38 | 24 | 30 | 33 |
| | (19,534) | (8,749) | (17,696) | (13,338) | (12,545) |

Lincoln School District
Unduplicated Count

| | | | | | |
|---|---|---|---|---|---|
| Reading Only | 50% | 41% | 24% | 27% | 22% |
| Math Only | 17 | 18 | 23 | 23 | 20 |
| Both Reading & Math | 33 | 41 | 53 | 50 | 57 |
| | (856) | (901) | (815) | (874) | (977) |

Duplicated Count

| | | | | | |
|---|---|---|---|---|---|
| Reading | 62 | 58 | 51 | 61 | 51 |
| Math | 38 | 42 | 49 | 39 | 49 |
| | (1138) | (1273) | (1251) | (1110) | (1535) |

service delivery. In 1981-82, about one-half of Chapter 1 students received reading services only, less than 20 percent were served by math only, and one-third received both subject area services. While the percentages of Chapter 1 students receiving only math instruction remained fairly constant at 20 percent, increasingly more students were served in both subject areas. In 1985-86, almost 60 percent of Chapter 1 students received both Chapter 1 reading and math instruction.

## WHAT ARE THE CHARACTERISTICS OF CATEGORICAL PROGRAM PARTICIPANTS?

The characteristics of recipients of categorical program services in terms of sex, ethnicity and achievement were examined to identify if recipients systematically differ from other district students. In terms of minority representation in the St. Louis student population, the five-year profile of first through eighth graders in the district revealed a fairly constant 80 percent minority enrollment over time. As demonstrated by data provided in Table 5, Chapter 1 program participants had a somewhat higher minority representation than was characteristic of the student population districtwide-- with 86 percent minority representation as compared to the district's overall 80 percent minority representation. As might be expected, Bilingual/ESL students were all minority students. Based on data provided in 1985-86, the special education population had a 77 percent minority representation, and thus was more comparable to the non-recipient population than to the overall district or Chapter 1 minority representation. As a result of desegregation efforts, minority representation in the district as well as the Chapter 1 program declined slightly.

In terms of minority representation in the Lincoln School District, the five-year profile of district enrollment revealed a constant seven percent minority enrollment districtwide. Chapter 1 programs had more than three times the minority representation than was characteristic of the district's population. While students who only participated in special education tended to be similar to the total district's population in terms of minority representation, students who participated in both special education and Chapter 1 (in either a sequential or simultaneous fashion) were more similar to the Chapter 1 population than to the special education or total district in terms of minority representation.

Chapter 1 programs in both districts tended to generate slightly greater representation of male participants, particularly in the area of reading where 53 percent of St. Louis recipients and about 55 percent of Lincoln recipients were male (See Table 6). Chapter 1 math programs demonstrated roughly equal numbers of male and female participants for most years in St. Louis, but were predominantly female for most years in the Lincoln School District. In both districts, special education populations were predominantly male, with the male representation in Lincoln averaging at two-thirds for most of the years examined.

Average achievement measures of Chapter 1 recipients and non-recipients were examined over a five-year period. For Chapter 1 recipients, these scores represent average post-treatment measures, since students are tested in the spring of each year. Thus, the first measure

Table 5. Percent Minority Representation for Recipients and Non-Recipients

| | St. Louis Public Schools | | | | |
|---|---|---|---|---|---|
| | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
| Chapter 1 | 86% | 86% | 86% | 86% | 83% |
| Reading Only | 85 | 85 | 87 | 85 | 82 |
| Math Only | 86 | 88 | 84 | 84 | 84 |
| Both Reading & Math | 90 | 90 | 87 | 86 | 82 |
| Non-Recipients | 74 | 77 | 75 | 74 | 76 |
| Total District | 79 | 80 | 80 | 79 | 78 |
| | Lincoln School District | | | | |
| Chapter 1 Only | 21% | 22% | 23% | 23% | 23% |
| Reading Only | 19 | 17 | 22 | 24 | 21 |
| Math Only | 16 | 29 | 24 | 26 | 24 |
| Both Reading & Math | 28 | 23 | 24 | 21 | 23 |
| Special Education Only | 6 | 7 | 7 | 8 | 9 |
| Special Education & Chapter 1 | 18 | 16 | 17 | 31 | 22 |
| Non-Recipients | 5 | 5 | 5 | 5 | 5 |
| Total District | 7 | 7 | 7 | 7 | 7 |

Table 6. Percent Male Representation for Recipients and Non-Recipients

| | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|
| **St. Louis Public Schools** | | | | | |
| Chapter 1 | 53% | 52% | 52% | 52% | 53% |
| Reading Only | 53 | 53 | 53 | 53 | 53 |
| Math Only | 51 | 50 | 46 | 49 | 50 |
| Both Reading & Math | 52 | 49 | 51 | 52 | 54 |
| Non-Recipients | 48 | 50 | 48 | 51 | 51 |
| Total District | 51 | 50 | 50 | 50 | 50 |
| **Lincoln School District** | | | | | |
| Chapter 1 Only | 52% | 51% | 47% | 55% | 46% |
| Reading Only | 56 | 57 | 53 | 55 | 48 |
| Math Only | 44 | 44 | 42 | 60 | 41 |
| Both Reading & Math | 49 | 49 | 47 | 51 | 47 |
| Special Education Only | 67 | 65 | 66 | 66 | 69 |
| Special Education & Chapter 1 | 66 | 75 | 63 | 57 | 59 |
| Non-Recipients | 49 | 49 | 49 | 49 | 49 |
| Total District | 51 | 51 | 51 | 51 | 51 |

obtained includes any effects that the year's participation in Chapter 1 had on average achievement. The five-year cross-sectional comparison of Chapter 1 reading recipients in St. Louis as compared to average district performance is displayed in Table 7. Though average achievement performance varies somewhat by grade and year, Chapter 1 participants tend to score between the 34th and 43rd NCE, while district students tend to score about 10 NCEs higher -- from the 42nd to 51st NCE. Yearly reading achievement measures for Chapter 1 reading programs in Grades 1-3 indicate that participants, on average, remain eligible for program services after the year's receipt of services. Both seventh and eighth grade recipients, however, scored above their eligibility scores.

The five-year comparison of Chapter 1 math recipients as compared to average district performance is also displayed in Table 7. The average Chapter 1 participant and district student scored higher in math than they did in reading. This finding held constant across grade levels and over time. Chapter 1 participants' average scores ranged from 38-51 NCEs over time and across grades, while the district's average scores ranged from 47-55 NCEs.

The average performance of Chapter 1 students who received both reading and math services were substantially lower than Chapter 1 students who received only one subject area service. This finding was characteristic at every grade level and over time. Similar to the comparative performance of other Chapter 1 students and non-recipients, dually-served Chapter 1 students demonstrated higher achievement in math than reading. Particularly in Grades 1-6, both reading and math average performance tended to improve over the five-year period. Dually-served student performance in 1985-86, however, was slightly lower at most grade levels than the performance of one subject area only participants.

Average reading achievement for Chapter 1 students in the Lincoln School District from a five-year, cross-sectional viewpoint was surprisingly consistent, generally demonstrating gains or losses in adjacent years of no more than two NCEs. Math scores tended to be more erratic from a five-year perspective. In most grades a cross-section of Chapter 1 math performance in 1985-1986 demonstrated an increase over the average achievement reported in 1981-1982 (See Table 8.) A similar apparent increase in average math achievement between 1981-1982 and 1985-1986 was demonstrated for the district population. On average, the district population gained from four to eight NCEs in relative standing over time depending on grade level examined.

The lack of consistency in the five-year average achievement of special education students is perhaps due to the great disparity in academic performance of students who are classified as recipients of special education services. Year-to-year fluctuations in types of handicapping conditions, many of which bear little relationship to expected achievement, may account for the great variations in average achievement.

Table 7. Average Achievement for Chapter 1 Recipients and Total District FY 1982 - FY 1986

St. Louis Public Schools

READING

| Grade | 1981-82 Chapter 1 | 1981-82 District | 1982-83 Chapter 1 | 1982-83 District | 1983-84 Chapter 1 | 1983-84 District | 1984-85 Chapter 1 | 1984-85 District | 1985-86 Chapter 1 | 1985-86 District |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 40 | 44 | 39 | 44 | 43 | 47 | 43 | 47 | 42 | 50 |
| 2 | 34 | 42 | 37 | 43 | 39 | 47 | 40 | 47 | 38 | 46 |
| 3 | 34 | 42 | 34 | 42 | 36 | 43 | 38 | 46 | 37 | 47 |
| 4 | 37 | 45 | 38 | 46 | 39 | 45 | 40 | 46 | 39 | 47 |
| 5 | 39 | 47 | 38 | 48 | 39 | 49 | 40 | 50 | 41 | 51 |
| 6 | 38 | 47 | 38 | 46 | 38 | 47 | 38 | 47 | 40 | 49 |
| 7 | 38 | 48 | 38 | 47 | 38 | 48 | 39 | 49 | 39 | 50 |
| 8 | 39 | 47 | 36 | 47 | 38 | 48 | 38 | 48 | 39 | 48 |

MATH

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 45 | 47 | 42 | 48 | 51 | 50 | 50 | 50 | 48 | 52 |
| 2 | 38 | 48 | 39 | 46 | 42 | 48 | 40 | 48 | 45 | 51 |
| 3 | 42 | 47 | 39 | 47 | 44 | 47 | 44 | 48 | 43 | 49 |
| 4 | 40 | 49 | 40 | 49 | 46 | 49 | 41 | 49 | 43 | 51 |
| 5 | 44 | 52 | 43 | 52 | 47 | 52 | 44 | 54 | 47 | 55 |
| 6 | 41 | 50 | 40 | 51 | 43 | 50 | 40 | 51 | 42 | 53 |
| 7 | 42 | 50 | 38 | 49 | 42 | 52 | 42 | 53 | 43 | 55 |
| 8 | 40 | 49 | 38 | 50 | 41 | 50 | 40 | 54 | 43 | 54 |

Table 8. Average Achievement for Chapter 1 Recipients and Total District FY 1982 - 1986

Lincoln School District

READING

| Grade | 1981-82 | | | | 1982-83 | | | | 1983-84 | | | | 1984-85 | | | | 1985-86 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Chpt 1 | Sp Ed | Chpt 1 & Sp Ed | Dist | Chpt 1 | Sp Ed | Chpt 1 & Sp Ed | Dist | Chpt 1 | Sp Ed | Chpt 1 & Sp Ed | Dist | Chpt 1 | Sp Ed | Chpt 1 & Sp Ed | Dist | Chpt 1 | Sp Ed | Chpt 1 & Sp Ed | Dist |
| 1 | 42 | 47 | 33 | 58 | 39 | 46 | 33 | 58 | 41 | 47 | 34 | 60 | 42 | 49 | 40 | 60 | 46 | 48 | 73 | 62 |
| 2 | 42 | 47 | 35 | 58 | 43 | 45 | 49 | 58 | 43 | 44 | 34 | 60 | 41 | 41 | 30 | 61 | 40 | 42 | 30 | 59 |
| 3 | 41 | 44 | 34 | 61 | 41 | 46 | 31 | 62 | 41 | 43 | 38 | 63 | 42 | 45 | 41 | 64 | 43 | 44 | 40 | 63 |
| 4 | 40 | 41 | 33 | 59 | 42 | 43 | 31 | 63 | 46 | 41 | 34 | 61 | 42 | 41 | 37 | 60 | 45 | 42 | 45 | 62 |
| 5 | 38 | 43 | 28 | 61 | 43 | 44 | 34 | 60 | 46 | 44 | 41 | 61 | 46 | 42 | 61 | 63 | 46 | 45 | 41 | 63 |
| 6 | 41 | 42 | 39 | 62 | 40 | 40 | 42 | 61 | 42 | 41 | 47 | 59 | 45 | 40 | 43 | 61 | 46 | 40 | 60 | 62 |
| | | | | | | | | | MATH | | | | | | | | | | | |
| 1 | 29 | 51 | 33 | 60 | 48 | 52 | 46 | 58 | 47 | 46 | 46 | 60 | 53 | 54 | 40 | 60 | 50 | 51 | 46 | 62 |
| 2 | 39 | 43 | 36 | 55 | 43 | 53 | 46 | 57 | 43 | 47 | 47 | 60 | 43 | 48 | 39 | 61 | 51 | 50 | 41 | 59 |
| 3 | 44 | 45 | 39 | 59 | 43 | 43 | 37 | 60 | 46 | 46 | 45 | 63 | 48 | 49 | 50 | 64 | 51 | 49 | 51 | 63 |
| 4 | 41 | 46 | 30 | 61 | 45 | 44 | 34 | 60 | 47 | 43 | 44 | 61 | 48 | 45 | 43 | 64 | 52 | 49 | 48 | 62 |
| 5 | 38 | 39 | 36 | 58 | 42 | 44 | 32 | 58 | 46 | 41 | 41 | 60 | 47 | 41 | 51 | 62 | 49 | 43 | 52 | 63 |
| 6 | 42 | 41 | 24 | 57 | 40 | 40 | 38 | 57 | 45 | 43 | 40 | 63 | 48 | 41 | 47 | 61 | 51 | 41 | 56 | 62 |

## LONG-TERM ACCOMPLISHMENTS OF CHAPTER 1 STUDENTS

Cohorts of first and second graders in the 1981-82 school year were tracked over their subsequent four years of schooling. In the following sections, patterns of categorical program participation, sustained achievement, and grade retention are described for St. Louis and Lincoln School Districts.

## WHAT ARE THE LONGITUDINAL PATTERNS OF CHAPTER 1 ENTRY AND EXIT?

Longitudinal analysis of a first-grade cohort in 1981-82 revealed that of a total St. Louis district first grade population of 5452 students, 2704 students (or 50 percent) remained in the district for as long as five years. Of these 2704 students, 2258 (or 84 percent) participated in the Chapter 1 program at some point during the five years.* While only six percent of Chapter 1 students were served for five years continuously, 21 percent were served for four years, 29 percent for three years, 26 percent for two years, and 19 percent for one year (see Table 9). Chapter 1 students received services for almost three years on average.

Patterns of program participation were examined over time by subject area --reading only, math only, the simultaneous receipt of reading and math services, and alternating patterns of reading, math, or dual program participation. These data are displayed in Table 10, and indicate that 42 percent of Chapter 1 students receive only reading services over time, and 47 percent are in and out of reading and/or math over time. Only 10 percent of Chapter 1 students receive exclusively math or simultaneous reading and math services over time, an indication of the smaller size of the Chapter 1 math program as well as limited resources to provide dual resources to many students.

Examination of a first-grade cohort in 1981-82 over the subsequent five years in Lincoln reveal that of a total district first grade population of 1901 students, 1154 (or 60 percent) remained in the district for the next five years. About 15 percent of these students participated in Chapter 1 at some point during the five-year period. Almost one-third of these participants were served for one year only, 23 percent each for two and three years, 16 percent for four years, and only seven percent for five continuous years (see Table 11). The five-year longitudinal investigation revealed that Chapter 1 students receive services for an average of 2.5 years.

Patterns of program participation over time and by subject area were examined. These data are displayed in Table 10 and indicate that the most prevalent pattern of participation is for students to experience alternating years of participation in the Chapter 1 reading, math, or both programs. The second most typical pattern of program participation is for

*Missing data on continuously enrolled students was encountered for less than 2 percent of the students. Subsequent five-year longitudinal analyses were based on 2,195 Chapter 1 students and 431 non-recipients.

Table 9. Longitudinal Chapter 1 Program Involvement
First Graders Starting in FY 1981-82
St. Louis Public Schools

| Years in Program | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 | No. of Students | Percent of Students |
|---|---|---|---|---|---|---|---|
| 1 | x | | | | | 144 | |
| | | x | | | | 28 | |
| | | | x | | | 91 | |
| | | | | x | | 93 | |
| | | | | | x | 68 | |
| | | | | | | (424) | 19% |
| 2 | x | x | | | | 30 | |
| | x | | x | | | 169 | |
| | x | | | x | | 58 | |
| | x | | | | x | 63 | |
| | | x | x | | | 22 | |
| | | x | | x | | 14 | |
| | | x | | | x | 14 | |
| | | | x | x | | 62 | |
| | | | x | | x | 72 | |
| | | | | x | x | 57 | |
| | | | | | | (561) | 25% |
| 3 | x | x | x | | | 43 | |
| | x | x | | x | | 20 | |
| | x | x | | | x | 23 | |
| | x | | x | x | | 146 | |
| | x | | x | | x | 103 | |
| | x | | | x | x | 114 | |
| | | x | x | x | | 19 | |
| | | x | x | | x | 12 | |
| | | x | | x | x | 18 | |
| | | | x | x | x | 137 | |
| | | | | | | (635) | 29% |
| 4 | x | x | x | x | | 43 | |
| | x | x | x | | x | 44 | |
| | x | x | | x | x | 37 | |
| | x | | x | x | x | 290 | |
| | | x | x | x | x | 37 | |
| | | | | | | (451) | 21% |
| 5 | x | x | x | x | x | 124 | 6% |
| | | | | | | (2195) | |

Table 10. Five-Year Longitudinal Chapter 1 Program Participation

St. Louis Public Schools

| Years in Program | Reading Only | Math Only | Both Reading and Math | Alternating Years of Reading or Math | Alternating Years of Both and Single Program Participation |
|---|---|---|---|---|---|
| 1 | 31% | 59% | 66% | -- | -- |
| 2 | 31 | 31 | 22 | 29 | 14 |
| 3 | 23 | 8 | 8 | 41 | 37 |
| 4 | 13 | 1 | 5 | 24 | 36 |
| 5 | 2 | 0 | 0 | 6 | 13 |
| | (923) | (157) | (65) | (427) | (623) |
| % of all Chapter 1 Participants | 42% | 7% | 3% | 19% | 28% |

Lincoln School District

| | | | | |
|---|---|---|---|---|
| 1 | 69% | 64% | 43% | 0% |
| 2 | 15 | 27 | 24 | 25 |
| 3 | 8 | 5 | 19 | 38 |
| 4 | 8 | 5 | 10 | 24 |
| 5 | 0 | 0 | 5 | 14 |
| | (48) | (22) | (21) | (88) |
| % of all Chapter 1 Participants | 27% | 12% | 12% | 49% |

Table 11. Longitudinal Chapter 1 Program Involvement
First Graders Starting in FY 1981-82
Lincoln School District

| Years in Program | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 | No. of Students | Percent of Students |
|---|---|---|---|---|---|---|---|
| 1 | x | | | | | 8 | |
| | | x | | | | 23 | |
| | | | x | | | 9 | |
| | | | | x | | 2 | |
| | | | | | x | 13 | |
| | | | | | | (55) | 31% |
| 2 | x | x | | | | 8 | |
| | x | | x | | | 0 | |
| | x | | | x | | 0 | |
| | x | | | | x | 1 | |
| | | x | x | | | 7 | |
| | | x | | x | | 4 | |
| | | x | | | x | 7 | |
| | | | x | x | | 2 | |
| | | | x | | x | 3 | |
| | | | | x | x | 9 | |
| | | | | | | (41) | 23% |
| 3 | x | x | x | | | 7 | |
| | x | x | | x | | 1 | |
| | x | x | | | x | 2 | |
| | x | | x | x | | 0 | |
| | x | | x | | x | 1 | |
| | x | | | x | x | 4 | |
| | | x | x | x | | 5 | |
| | | x | x | | x | 3 | |
| | | x | | x | x | 1 | |
| | | | x | x | x | 18 | |
| | | | | | | (42) | 23% |
| 4 | x | x | x | x | | 2 | |
| | x | x | x | | x | 1 | |
| | x | x | | x | x | 1 | |
| | x | | x | x | x | 0 | |
| | | x | x | x | x | 24 | |
| | | | | | | (28) | 16% |
| 5 | x | x | x | x | x | 13 | 7% |
| | | | | | | (179) | |

students to participate in the reading program exclusively (and generally for no longer than one year). Slightly more than 10 percent of Chapter 1 participation over time is exclusively in math, and another ten percent is dually served by reading and math programs during their years of participation in Chapter 1.

WHAT ARE THE PATTERNS OF SUSTAINED ACHIEVEMENT FOR CHAPTER 1 PARTICIPANTS?

The achievement of students participating in Chapter 1 programs in St. Louis for different lengths of time was examined over a five-year period (See Table 12). A retrospective examination of reading scores in 1981-82 for students who subsequently received differing numbers of years of Chapter 1 participation reveals a perfect rank ordering; that is, students who only received one year of Chapter 1 services over the subsequent four years scored highest in 1981-82, and students who received five years of services scored lowest in 1981-82. As the data in Table 12 demonstrate, this rank ordering was preserved for each of the five years. Also apparent is the relative stability of achievement scores over time. Although some year-to-year fluctuation occurred, gains and losses were not cumulative overall. That is, an apparent gain between two years' performance was generally followed by a loss of equal magnitude. Only five-year reading recipients demonstrated gains in relative standing over time. One-year Chapter 1 participants scored on average 15 NCE points higher than did five-year participants. Five-year longitudinal math achievement showed similar patterns of sustained achievement with one exception: the performance of one-year and two-year recipients was similar at all testing points. The sustained achievement of both non-recipients of categorical services as well as the overall district performance was relatively stable over time.

The average achievement of the 179 students participating in Chapter 1 programs in Lincoln for differing years of participation were compared to the longitudinal performance of non-recipients and the total district. Similar to the findings in St. Louis, Chapter 1 students' performance ranked perfectly with years of participation. Higher performing students in 1981-82 received the shortest amount of Chapter 1 exposure over a five-year period, and the lowest-performing students received the most exposure. Average student performance for Chapter 1 students (regardless of length of participation) demonstrated a steady increase between 1981-82 and 1985-86, generally on the order of four to five NCEs. The average achievement of non-recipient students and the total district demonstrated a similar increase. Only in the case of three-, four- and five-year recipients of Chapter 1 math services did average student scores remain relatively stable (see Table 13).

A second five-year longitudinal cohort of students was examined to determine the extent to which sample selection and methodological concerns may influence conclusions regarding the sustained achievement of Chapter 1 students. A cohort of second graders in 1981-82 remaining in the district for the subsequent five years was examined. These data are displayed in Tables 14 and 15, and indicate that the second grade cohort in St. Louis was an initially lower-performing group than the first-grade cohort; in Lincoln, however, the first grade cohort was initially lower-performing.

Table 12. Longitudinal Achievement of Chapter 1 Recipients, Non-Recipients and Total District
St. Louis Public Schools

READING

| | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|
| Years of Participation: | | | | | |
| 1 | 49 | 49 | 48 | 48 | 50 |
| 2 | 44 | 44 | 42 | 43 | 45 |
| 3 | 42 | 39 | 37 | 39 | 41 |
| 4 | 38 | 36 | 34 | 34 | 38 |
| 5 | 31 | 34 | 31 | 32 | 34 |
| Non-Recipients | 61 | 62 | 61 | 62 | 65 |
| Total District | 47 | 46 | 45 | 45 | 48 |

MATH

| | | | | | |
|---|---|---|---|---|---|
| 1 | 44 | 44 | 42 | 43 | 45 |
| 2 | 45 | 40 | 41 | 42 | 46 |
| 3 | 36 | 37 | 37 | 37 | 43 |
| 4 | 38 | 34 | 37 | 38 | 39 |
| Non-Recipients | 65 | 63 | 65 | 65 | 69 |
| Total District | 49 | 47 | 47 | 48 | 51 |

*Scores reported are average Normal Curve Equivalent Scores

Table 13. Longitudinal Achievement of Chapter 1 Recipients, Non-Recipients and Total District

Lincoln School District

READING

| | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|
| Years of Participation: | | | | | |
| 1 | 54 | 55 | 60 | 57 | 59 |
| 2 | 43 | 46 | 46 | 47 | 52 |
| 3 | 36 | 42 | 42 | 47 | 45 |
| 4 | 38 | 36 | 41 | 38 | 41 |
| 5 | 35 | 31 | 37 | 37 | 38 |
| Non-Recipients | 65 | 65 | 69 | 67 | 69 |
| Total District | 62 | 62 | 66 | 64 | 66 |

MATH

| | | | | | |
|---|---|---|---|---|---|
| 1 | 52 | 46 | 55 | 56 | 55 |
| 2 | 50 | 46 | 50 | 50 | 52 |
| 3 | 41 | 48 | 45 | 47 | 45 |
| 4 | 46 | 36 | 39 | 44 | 44 |
| Non-Recipients | 67 | 61 | 69 | 71 | 69 |
| Total District | 65 | 59 | 67 | 69 | 67 |

*Scores reported are average Normal Curve Equivalent Scores.

Table 14. Longitudinal Achievement of Chapter 1 Recipients, Non-Recipients and Total District

Second Grade Cohort
St. Louis Public Schools

READING

| | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|
| Years of Participation: | | | | | |
| 1 | 43 | 43 | 47 | 49 | 49 |
| 2 | 38 | 38 | 41 | 44 | 45 |
| 3 | 33 | 34 | 36 | 39 | 41 |
| 4 | 32 | 32 | 33 | 35 | 39 |
| 5 | 26 | 30 | 31 | 31 | 38 |
| Non-Recipients | 57 | 57 | 61 | 63 | 62 |
| Total District | 42 | 42 | 45 | 48 | 49 |

MATH

| | | | | | |
|---|---|---|---|---|---|
| 1 | 43 | 42 | 44 | 47 | 49 |
| 2 | 34 | 33 | 38 | 39 | 41 |
| 3 | 32 | 34 | 38 | 39 | 40 |
| 4 | 26 | 27 | 30 | 31 | 33 |
| Non-Recipients | 59 | 62 | 65 | 68 | 65 |
| Total District | 47 | 48 | 51 | 53 | 53 |

*Scores reported are average Normal Curve Equivalent Scores

Table 15. Longitudinal Achievement of Chapter 1 Recipients, Non-Recipients and Total District
Second Grade Cohort
Lincoln School District

READING

| | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|
| Years of Participation: | | | | | |
| 1 | 50 | 55 | 58 | 58 | 56 |
| 2 | 43 | 48 | 52 | 54 | 52 |
| 3 | 40 | 41 | 43 | 43 | 45 |
| 4 | 38 | 43 | 48 | 48 | 46 |
| 5 | 37 | 41 | 41 | 46 | 43 |
| Non-Recipients | 66 | 69 | 67 | 69 | 68 |
| Total District | 62 | 65 | 64 | 66 | 65 |

MATH

| | | | | | |
|---|---|---|---|---|---|
| 1 | 50 | 53 | 57 | 52 | 58 |
| 2 | - | 47 | 50 | 50 | 48 |
| 3 | 35 | 42 | 47 | 47 | 51 |
| 4 | 37 | 42 | 46 | 40 | 47 |
| Non-Recipients | 62 | 67 | 70 | 67 | 71 |
| Total District | 60 | 64 | 68 | 65 | 68 |

*Scores reported are average Normal Curve Equivalent Scores

Conclusions regarding the sustained achievement of Chapter 1 varied significantly depending on which longitudinal cohort was analyzed in St. Louis: the first grade cohort remained stable over time, while the second grade cohort demonstrated achievement gains in both reading and math over the five-year period. This relative gain in achievement was not restricted to Chapter 1 participants, however. Gains in achievement in both reading and math were achieved for the district as well.

The analyses of a second longitudinal cohort in the Lincoln School District yielded results similar to the first cohort analysis: both Chapter 1 participants and the total district demonstrated gains in achievement over the five-year period.

WHAT ARE THE RETENTION IN GRADE EXPERIENCES OF CHAPTER 1 STUDENTS?

Long-term experiences of Chapter 1 students were also examined from the perspective of grade retention. Of the 1981-82 first grade cohort of St. Louis students who received Chapter 1 services at some point during the five-year period, more than one-fourth had already been retained in grade. This compares to an 8 percent prior retention for the non-recipient cohort. An additional 33 percent of students in the Chapter 1 longitudinal cohort were retained in grade during at least one of the subsequent four years, compared to only nine percent of non-recipients. Thus, by the time Chapter 1 recipients reach the sixth grade in the St. Louis district, 60 percent have been retained for at least one grade.

Retention in the Lincoln School District proved to be a relatively rare event within the first five grades. Only five percent of the first grade cohort were retained at any time during the five-year period; no student was retained for more than one grade. Nine percent of Chapter 1 students were retained, compared to four percent of the non-recipient students.

The comparison of the sustained achievement of Chapter 1 and non-recipient grade repeaters and non-repeaters is displayed in Table 16. Longitudinal achievement appears to be highly variable for students retained in grade at first glance. Closer examination reveals that average achievement scores in the years students are retained are exceedingly low. These scores are followed by retention in grade and large increases in achievement in the following year, generally on the order of 10-20 NCEs. These large fluctuations in achievement scores raise questions regarding both the validity of the initial extremely low score and the validity of the extreme gain in achievement in the following year, which of course is followed by a sizable loss at the third testing point. The fact that achievement scores tend to stabilize in the following three years may speak more to earlier questionable testing results than to any statements regarding the sustained achievement of students retained in grade.

The comparison of both initial and sustained achievement for Chapter 1 participants and non-recipients indicates that factors other than achievement performance enter into the decision to retain non-Chapter 1 participants. While non-recipient achievement performance was considerably lower in the year these students were retained, it still exceeded the level of performance of most Chapter 1 students.

Table 16. Longitudinal Achievement of Chapter 1 and Non-Recipient Grade Repeaters and Non-Repeaters St. Louis School District

READING

| | | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|---|---|---|---|---|---|---|---|
| REPEATERS: | | | | | | | |
| Retained in 1st Grade 80-81 | Chapter 1 | 30 | 49 | 39 | 38 | 39 | 42 |
| | Non-Recipients | 44 | 60 | 54 | 52 | 56 | 58 |
| Retained in 1st Grade 81-82 | Chapter 1 | | 32 | 52 | 43 | 39 | 40 |
| | Non-Recipients | | 44 | 64 | 54 | 55 | 52 |
| Multiple Repeaters | Chapter 1 | 25 | 40 | 34 | 34 | 33 | 36 |
| | Non-Recipients | 44 | 46 | 45 | 37 | 43 | 41 |
| NON-REPEATERS: | Chapter 1 | | 49 | 46 | 45 | 47 | 49 |
| | Non-Recipients | | 63 | 62 | 62 | 63 | 66 |

MATH

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| REPEATERS: | | | | | | | |
| Retained in 1st Grade 80-81 | Chapter 1 | 32 | 56 | 45 | 42 | 43 | 48 |
| | Non-Recipients | 52 | 71 | 60 | 60 | 62 | 65 |
| Retained in 1st Grade 81-82 | Chapter 1 | | 34 | 58 | 47 | 44 | 46 |
| | Non-Recipients | | 51 | 70 | 62 | 58 | 56 |
| Multiple Repeaters | Chapter 1 | 24 | 46 | 41 | 39 | 39 | 41 |
| | Non-Recipients | 44 | 58 | 52 | 42 | 51 | 56 |
| NON-REPEATERS: | Chapter 1 | | 53 | 47 | 49 | 49 | 55 |
| | Non-Recipients | | 66 | 63 | 66 | 66 | 71 |